SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Ravine Lake, Beadle County
2102-F-21-R-48
2015

Figure 1. Ravine Lake, Beadle County

Legal Description: T111N-R61W-Sec 6, 30, 31
Location from nearest town: Highway 14, east edge of Huron, SD

Surface Area: 72 acres
Meandered (Y/N): no
OHWM elevation: none set
Outlet elevation: no data
Max. depth at outlet elevation: 14 feet
Observed water level: full
Contour map available (Y/N): yes

Watershed area: 77,178 acres
Shoreline length: 3.5 miles
Date set: NA
Date set: NA
Mean depth at outlet elevation: 6.4 feet
Lake volume: 459.5 acre-feet
Date mapped: 1988

DENR beneficial use classifications: (5) warmwater semipermanent fish life propagation, (7) immersion recreation, (8) limited contact recreation and (9) wildlife propagation and stock watering.

Introduction

General

Ravine Lake is an artificial impoundment formed by the construction of a dam across Broadland Creek. Located on the north edge of Huron, the lake is an important recreational asset for the City of Huron. The lake has a long history of poor water quality, algae blooms, overabundant rough fish populations and frequent fish kills. In 1998, 95,812 cubic yards of silt were removed from the lake by dredging at a cost of nearly $200,000. While the dredging made the lake deeper, it did little for water quality and fish kills still occur regularly.

Ownership of Lake and Adjacent Lakeshore Properties

Ravine Lake is owned by the City of Huron and the fishery is managed by the South Dakota Department of Game, Fish and Parks (GFP). Any property not owned by the City of Huron is privately owned.

Fishing Access

Boats can be launched on the sandy beach located on the east side of the lake and shore fishing is available at several locations on city property.

Water Quality and Aquatic Vegetation

Water clarity was fair with a Secchi depth measurement of 91 cm (36 in, Table 1), despite being stained brown. Cattails were observed in multiple shoreline locations on the north end of the lake.

Table 1. Water temperature, Secchi depth and observations/comments on water quality and aquatic vegetation in Ravine Lake, Beadle County, 2006-2015.

Year	*Water Temp °C (°F)*	*Secchi Depth cm (in)*	*Observations/Comments (algae, aquatic vegetation, water quality, etc.)*
2015	28 (82)	79 (31)	Water stained brown, cattail
2014	26 (78)	91 (36)	Cattails
2013	25 (77)	91 (36)	Small amount of sago pondweed
2011	27 (81)	61 (24)	Coontail and cattail
2009	24 (76)	76 (30)	Sago pondweed
2007	-- (--)	-- (--)	Water stained brown, no algae or vegetation

Fish Community

Ravine Lake contains a very diverse fish community comprised of many different species (Table 2). Black bullhead is the most common species found in the lake.

Table 2. Fish species commonly found in Ravine Lake, Beadle County.

Game Species	*Other Species*
White Crappie	Bigmouth Buffalo
Channel Catfish	Common Carp
Walleye	Freshwater Drum
Northern Pike	
White Bass	
Yellow Perch	
Black Bullhead	
Green Sunfish	
Orange-spotted Sunfish	
Hybrid Sunfish	

Fish Management

The main fisheries management objective for Ravine Lake is to create angling opportunity for the residents of Huron. However, stockings of various game fish species have been relatively ineffective at providing good fishing opportunity (Table 4). Several factors including poor water quality, algae blooms, high rough fish populations, and frequent kills (Table 3) make managing this fishery a challenge.

Table 3. Fish kill history for Ravine Lake, Beadle County.

Year	*Severity*	*Comments*
2003	Moderate	Late summer kill – multiple species, low DO
2004	Light	Late August - only small common carp observed
2013	Moderate	Summer kill – multiple species, low DO

Table 4. Stocking history for Ravine Lake, Beadle County, 2006-2015.

Year	*Number*	*Species*	*Size*
2006	166	Channel Catfish	Adult
2007	519	Walleye	Adult
2010	400	White Bass	Adult
2012	18,400	Walleye	Fingerling
	3,816	Yellow Perch	Adult
2013	384	Northern Pike	Adult
	990	Yellow Perch	Adult
2014	400	Northern Pike	Adult
	83,000	Walleye	Fry

Methods

Ravine Lake was sampled on August 4-5, 2015 with four overnight trap nets. The trap nets were constructed with 19-mm-bar-mesh (¾ in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads.

Results and Discussion

Net Catch Results

Black bullhead dominated the trap net catch (97.2%) followed by common carp and yellow perch (Table 5). As in the previous two years, the majority of bullheads sampled were sub-stock length (15 cm, 6 in, Table 6). Yellow perch CPUE decreased to 2.8. Other game species sampled were channel catfish and walleye.

Table 5. Total catch from four overnight trap nets set in Ravine Lake, Beadle County, August 4-5, 2015

Species	*#*	*%*	*CPUE[1]*	*80% C.I.*	*Mean CPUE**	*PSD*	*RSD-P*	*Mean Wr*
Black Bullhead	1,342	97.2	335.5	±139.8	233.7	0	0	--
Common Carp	14	1.0	3.5	±2.4	4.9	15	0	--
Yellow Perch	11	0.8	2.8	±2.4	3.3	44	0	85
Channel Catfish	9	0.7	2.3	±2.9	2.1	--	--	--
O. S. Sunfish*	3	0.2	0.8	±1.0	0.5	--	--	--
Walleye	1	0.1	0.3	±0.3	0.2	--	--	--

*10 years (2006-2015)

Table 6. CPUE by length category for selected species sampled with trap nets in Ravine Lake, Beadle County, August 4-5, 2015.

Species	*Substock*	*Stock*	*S-Q*	*Q-P*	*P+*	*All sizes*	*80% C.I.*
Black Bullhead	281.8	53.8	53.8	--	--	335.5	±139.8
Common Carp	0.3	3.3	2.8	0.5	--	3.5	±2.3
Yellow Perch	0.5	2.3	1.3	1.0	--	2.8	±2.4
Channel Catfish	2.0	0.3	0.3	--	--	2.3	±2.9
O. S. Sunfish*	--	--	--	--	--	0.8	±1.0
Walleye	--	0.3	0.3	--	--	0.3	±0.3

*No length categories established. Length categories can be found in Appendix A.

Table 7. Trap-net CPUE for selected fish species sampled in Ravine Lake, Beadle County, 2006-2015.

Species	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*
Bigmouth Buffalo		--		--		--		--	0.6	--
Black Bullhead		104.4		41.0		62.4		568.0	290.8	335.5
Black Crappie		0.4		4.4		0.2		--	--	--
Channel Catfish		3.0		1.0		--		5.4	0.8	2.3
Common Carp		1.2		0.8		9.4		7.8	6.0	4.0
Freshwater Drum		--		--		--		--	0.2	--
Green Sunfish		--		1.6		0.6		--	--	--
Hybrid Sunfish		--		0.6		1.4		1.0	1.4	--
Northern Pike		--		--		--		0.4	0.6	--
O.S. Sunfish		2.0		--		--		--	--	0.8
Walleye		--		0.4		--		0.2	--	0.3
White Crappie		8.6		4.4		--		--	--	--
Yellow Perch		10.8		0.2		0.2		0.6	5.2	2.8

[1] See Appendix A for definitions of CPUE, PSD, RSD, RSD-P and mean Wr.

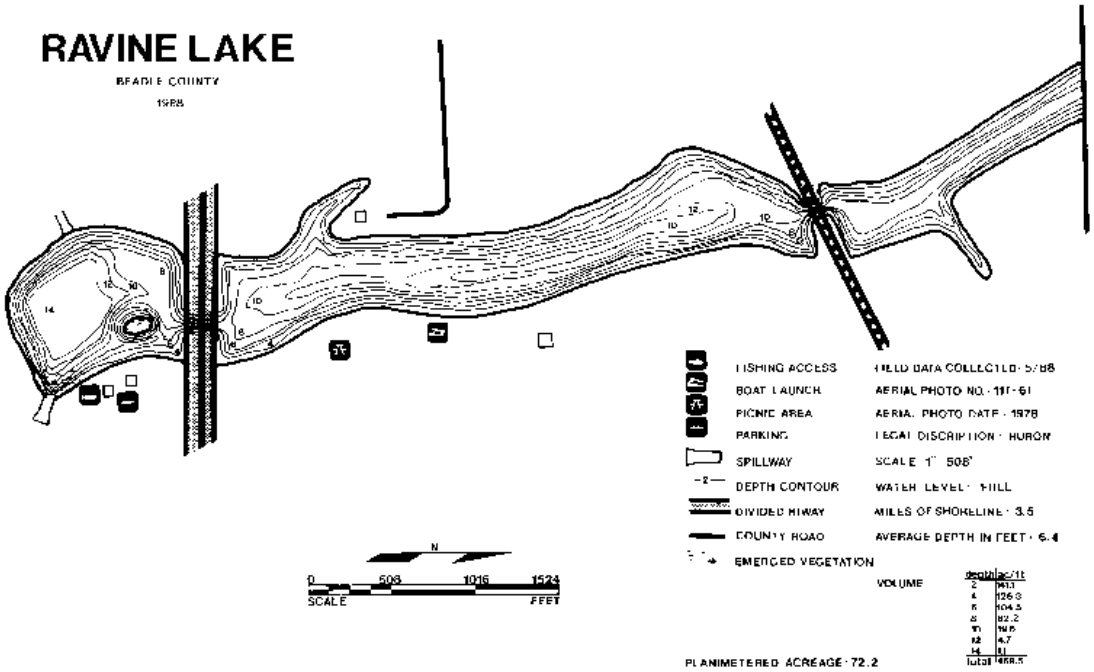

Figure 2. Contour map of Ravine Lake, Beadle County.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$PSD = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$RSD\text{-}P = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters (Inches in parenthesis).

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25 (10)	38 (15)	51 (20)	63 (25)	76 (30)
Yellow perch	13 (5)	20 (8)	25 (10)	30 (12)	38 (15)
Black crappie	13 (5)	20 (8)	25(10)	30 (12)	38 (15)
White crappie	13 (5)	20 (8)	25(10)	30 (12)	38 (15)
Bluegill	8 (3)	15 (6)	20 (8)	25 (10)	30 (12)
Largemouth bass	20 (8)	30 (12)	38 (15)	51 (20)	63 (25)
Smallmouth bass	18 (7)	28 (11)	35(14)	43 (17)	51 (20)
Northern pike	35 (14)	53 (21)	71 (28)	86 (34)	112 (44)
Channel catfish	28 (11)	41 (16)	61 (24)	71 (28)	91 (36)
Black bullhead	15 (6)	23 (9)	30 (12)	38 (15)	46 (18)
Common carp	28 (11)	41 (16)	53 (21)	66 (26)	84 (33)
Bigmouth buffalo	28 (11)	41 (16)	53 (21)	66 (26)	84 (33)

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.